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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,859	06/27/2001	Steven E. Lucco	MS1-545US	3683
22801	7590	10/15/2004	EXAMINER	
LEE & HAYES PLLC 421 W RIVERSIDE AVENUE SUITE 500 SPOKANE, WA 99201			DANG, DUY M	
			ART UNIT	PAPER NUMBER
			2621	5

DATE MAILED: 10/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/894,859

Applicant(s)

LUCCO, STEVEN E.

Examiner

Duy M Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/27/01 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Lucco (“Split-Stream Dictionary Program Compression”, ACM SIGPLAN Notices, Volume 35, Issue 5, pages: 27-34, May 2000).

Regarding claims 1, and 20, Lucco teaches:

forming a dictionary containing base entries representing individual instructions in a program and sequence entries representing corresponding sequences of multiple instructions in the program [see page 30, section 2.1 (Overview of SSD), first paragraph: constructing a dictionary that contains two types of entries which are base entries and sequence entries. The base entries correspond to individual instructions that occur in the program and the sequence entries correspond to two- to four-instructions that occur in the program]; and

generating items that represent the program in terms of the base entries and the sequence entries [i.e., the “SSD items” mentioned in page 30, section 2.1 (Overview of SSD), second paragraph]

Regarding claim 2, Lucco further teaches wherein split-stream dictionary [see section 1 (Introduction) on page 27 right column, third paragraph, line 5).

Regarding claims 3, 15, 25, Lucco further teaches wherein the sequence entries represent short sequences consisting of two to four instructions [see section 2.1 (Overview of SSD) on page 30, left column, first paragraph].

Regarding claim 4, Lucco further teaches wherein the sequence entries represent sequences of multiple instructions that are used multiple times in the program [see section 2.1 (Overview of SSD) on page 30, left column, first paragraph].

Regarding claim 5, Lucco further teaches wherein the generating comprises:  
comparing an input string of instructions to the sequence entries in the dictionary [see section 2.1 (Overview of SSD) on page 30, left column, second paragraph. Note the matching between the input instructions *i1 to i4* in a given program P and the sequence entries in the dictionary]; and

if the input string matches a particular sequence entries, generating an item that references to the particular sequence entry [see section 2.1 (Overview of SSD) on page 30, left column, second paragraph. Note the “generating SSD item” mentioned in first 7 lines].

Regarding claims 6, 21, 28, Lucco further teaches wherein the generating comprises:  
comparing progressively smaller strings of multiple instructions, where each string begins with a first instruction, to the sequence entries in the dictionary [see section 2.1 (Overview of SSD) on page 30, left column, second paragraph. Note the matching against 3 instruction sequences *i1 to i3* to generate SSD item]; and

if any string of multiple instructions matches a particular sequence entry, generating a first item that references the particular sequence entry [see section 2.1 (Overview of SSD) on

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page 30, left column, second paragraph. Note the generating SSD item referring to e sequence entry]; and

if no string of multiple instruction matches the sequence entries, generating a second item that references a base entry associated with the first instruction [see section 2.1 (Overview of SSD) on page 30, left column, second paragraph. Note last 5 lines which describes generating SSD item referring to base entry matching].

Regarding claim 7, Lucco further teaches compressing the dictionary [see page 27, section 1 (Introduction), third paragraph, line 5: SSD compression. Also note detailed SSD compression mentioned in section 2.2.1 (Base Entry Compression) and section 2.2.2 (Sequence Entry Compression)].

Regarding claims 8, 16, Lucco further teaches compressing the base entries of the dictionary [see section 2.2.1 (Base Entry Compression) mentioned on page 31 left column].

Regarding claims 9, 17, 26, Lucco further teaches wherein the compressing comprises: sorting the base entries by opcodes to create instruction groups so that there is one instruction group for each opcode [see section 2.2.1 (Base Entry Compression) mentioned on page 31 left column, first paragraph, lines 1-3].; and

for each instruction group, sorting the base entries according to size of individual instruction field and outputting each instruction field as a separate stream [see section 2.2.1 (Base Entry Compression) mentioned on page 31 left column, lines 3-16].

Regarding claims 10, 18, Lucco further teaches compressing the sequence entries of the dictionary [see section 2.2.2 (Sequence Entry Compression) mentioned on page 31 left column].

Regarding claims 11, 19, 27, Lucco further teaches wherein the compressing comprises constructing tree structures for individual sequences of multiple instructions[see section 2.2.2 (Sequence Entry Compression) mentioned on page 31 left column].

Regarding claims 12, 22, Lucco further teaches computer readable medium [see ROM, RAM, disk space mentioned on page 27, section 1 (Introduction)].

Regarding claim 13, 23, Lucco further teaches a computer-executable instructions [see [age 27, right column, section 1 (Introduction), third paragraph. Note program compression scheme].

The advanced statements as applied to claim 1 above are incorporated herein. Regarding claim 14, Lucco further teaches analyzing a program containing multiple instruction [see page 30, left column, section 2.1 (Overview of SSD). Note the determination whether input program were to avoid re-using any instruction];

The advanced statements as applied to claim 1 above are incorporated herein. Regarding claim 24, Lucco further teaches compressing the base entries and the sequence entries to produce a compressed dictionary and generating items that represent the program in terms of the base entries and the sequence entries (see sections 2.2.1 (base entry compression), 2.2.2 (sequence entry compression) and 2.2.3 (SSD item generation) in page 31].

Regarding claims 29, Lucco further decompressing the compressed dictionary [see section 2.2.4 (JIT Translation) on page 31 right column Note that this section refers to a decompression scheme].

Regarding claim 30, 32-33, Lucco further teaches translating the items back to the instructions by using the base entries and the sequence entries of the dictionary [see section 2.2.4

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(JIT Translation) on pages 31-32, second paragraph Note the reconstruction base and sequence entries by VM].

Regarding claim 31, Lucco further teaches computer readable medium [see ROM, RAM, disk space mentioned on page 27, section 1 (Introduction)]. .

Regarding claim 34, Lucco further teaches wherein the translating comprises copying the base entries and the sequence entries into a code buffer [see “copy phrase” mentioned on page 32 first line below table 4].

Regarding claim 35, Lucco further teaches a computer-executable instructions [see [age 27, right column, section 1 (Introduction), third paragraph. Note program compression scheme].

The advanced statements as applied to claim 24 above are incorporated herein. Regarding claim 36, Lucco further teaches read a program containing multiple instructions [see page 30, left column, section 2.1 (Overview of SSD). Note the determination whether input program were to avoid re-using any instruction].

Regarding claims 37, Lucco further teaches wherein the sequence entries represent short sequences consisting of two to four instructions [see page 30, left column, section 2.1 (Overview SSD), first paragraph, lines 4-7].

Regarding claim 38, Lucco further teaches comprises instructions to compress the dictionary [see program compression scheme for performing SSD compression mentioned on page 27, section 1, 3<sup>rd</sup> paragraph].

Regarding claims 39, this claim is also rejected for the same reasons as set forth in claim 9 above.

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Regarding claim 40, Lucco further teaches comprising instruction to compress the sequence entries by constructing tree structures for individual sequence of multiple instructions [see page 31, left column, section 2.2.2 (sequence entry compression)].

Regarding claim 41, this claim is rejected for the same reasons as set forth in claim 6 above.

The advanced statements as applied to claim 1 above are incorporated herein. Regarding claim 42, Lucco further teaches a program compression architecture [see program compression scheme for performing SSD compression mentioned on page 27, section 1, 3<sup>rd</sup> paragraph].

Regarding claim 43, Lucco further teaches wherein the sequence entries represent short sequences consisting of two to four instructions [see page 30 left column, section 2.1, first paragraph].

Regarding claim 44, Lucco further teaches wherein the item generator is configured to compare an input string of instructions to the sequence entries in the dictionary and if the input string matches a particular sequence entries, generating an item that references to the particular sequence entry [see page 30 left column, section 2.1, 2<sup>nd</sup> paragraph].

Regarding claim 45, this claim is rejected for the same reasons as set forth in claim 41 above.

Regarding claim 46, Lucco further teaches dictionary compressor to compress the dictionary [see program compression scheme for performing SSD compression mentioned on page 27, section 1, 3<sup>rd</sup> paragraph].



Regarding claim 47, Lucco further teaches wherein the dictionary compressor is configured to compress the base entries independently of the sequence entries [see sections 2.2.1 to 2.2.2 on left column of page 31 for base and sequence entries compressions].

Regarding claim 48, Lucco further teaches wherein the dictionary compressor is configured to sort the base entries by opcodes to create instruction groups so that there is one instruction group for each opcode, the dictionary compressor being further configured to sort the base entries within each instruction group according to size of individual instruction fields and outputting each instruction field as a separate stream [see section 2.2.1 (base entry compression) in left column of page 31].

Regarding claim 49, Lucco further teaches wherein the dictionary compressor is configured to construct tree structures for individual sequences of multiple instructions [see section 2.2.2 (sequence entry compression) on left column of page 31].

Regarding claim 50, Lucco further teaches an embedded system [see page 27, last paragraph of right column].

The advanced statement as applied to claim 24 above are incorporated herein. Regarding claim 51, Lucco further a computer comprising a memory [see page 27 right column, section 1 (introduction) 1<sup>st</sup> paragraph] and a program compression [see page 27 right column, section 1 (introduction) 3<sup>rd</sup> paragraph].

Regarding claim 52, Lucco further teaches program compression system is further configured to compress the dictionary [see program compression scheme for performing SSD compression mentioned on page 27, section 1, 3<sup>rd</sup> paragraph].

Regarding claim 53, this claim is rejection for the same reasons as set forth in claim 1 above.

Regarding claim 54, Lucco further teaches items that reference the base entries and the sequence entries to represent instructions strings in the program [see page 30 left column section 2.1 (Overview SSD), 2<sup>nd</sup> paragraph].

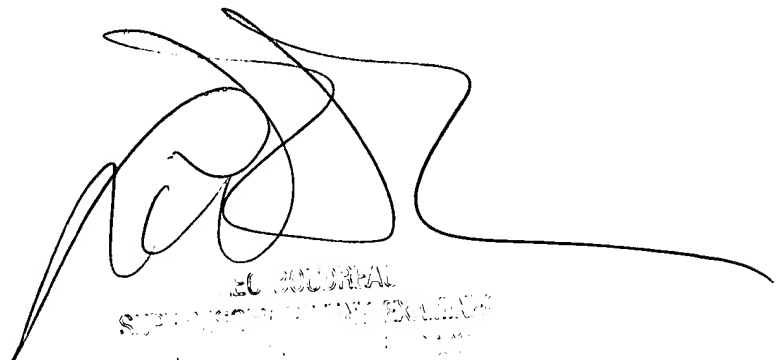
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy M Dang whose telephone number is 703-305-1464. The examiner can normally be reached on Monday to Friday from 5:30AM to 2:00PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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